

**EXPERIMENTAL PROJECT PROPOSAL
FOR THE EVALUATION OF A
PavePrep[®] WATERPROOF MEMBRANE AND A
0.15' PLANT MIX OVERLAY ON AN EXISTING BRIDGE DECK**

Location: U.S. 2, Two Medicine Bridge, from MP 209.91 to 210.18
(Glacier County)

Project Number: RTF-STPHS 1-3(22)210[1374]

Type of Project: Placement of PavePrep[®] Waterproof Membrane and a
0.15' Plant Mix Overlay on an Existing Bridge Deck

Principal Investigator: Construction: Dennis Leo/ Engineering Project Manager
Annual and Final Reports: Research Management Unit
Objective

The purpose of this study is to evaluate the feasibility of using a water-proofing membrane and a hot mix asphalt overlay to preserve this bridge deck in reasonable condition until this bridge can be replaced.

The main purpose of the water-proofing membrane is to limit the penetration of water through the plant mix surfacing. Once moisture penetrates through the surface, it tends to become trapped under the surface thus accelerating corrosion of the reinforcing steel which causes additional cracks, spalls, and delaminations of the concrete.

A secondary purpose of this membrane is to function as a stress relief interlayer material thereby limiting reflective cracking.

The specific PavePrep[®] membrane used in this project was chosen due to the stringent traffic control specifications. Completely “cleaning the deck surface for patching and repaving normally requires days of rerouting traffic and congestion.” “PavePrep[®] is a composite of specialized asphalt mastic with select geotextiles on its top and bottom surfaces. PavePrep’s[®] surface is traffic-worthy once cooled to ambient temperature, permitting unrestricted vehicle flow until the final asphalt overlay is applied” (Application Bulletin, Contech Construction Products, Middletown, Ohio).

Due to the length of detour and the narrow width of the bridge deck, the use of other membrane systems would have lengthened the construction time and thus increased the cost of construction and subjected the traveling public to additional risk.

Experimental Design

The majority of this project consists of bridge work, which includes joint repair, deck preparation, placement of a waterproof membrane, a 45 mm (0.15') minimum plant mix bridge deck overlay, bridge rail upgrade and concrete bent cap repair.

This bridge work will be completed (1997) in the east and westbound lanes of US 2 between MP 210.02 and 210.16.

Prior to placing the membrane, any sharp edges or projections which could puncture the membrane will be removed. Also, loose or broken concrete will be removed from the deck surface by sandblasting and cleaning with compressed air. Finally, all holes and spalls will be patched to the level of the surrounding surface with rapid set high strength concrete.

The pavement design consists of the application of the PavePrep[®] membrane to the surface of the bridge deck followed by a 0.15' Plant Mix Overlay. A minimum of three monitoring stations will be established. Each station will extend approximately 50 meters or 150 feet on either side of its nominal delineator or milepost. Within the domain of each station, the annual evaluation will include crack counts, rut measurements, and a visual survey of bridge condition. Formal bridge inspections are conducted by the Engineering Project Manager every other year.

Estimated Quantities and Cost

The Total Cost of the project was \$317,251, as represented by the bid tabs. There are no comparable treatments since there is no reasonable detour available to allow time for construction, and the Bridge Bureau did not feel this bridge could be economically repaired in sections in constructability terms.

It should be noted that this analysis does not take into account life-cycle costs, including the potential for extended pavement life and reduced maintenance. It should also be emphasized that the costs reported for this project may not be typical of costs that would be experienced elsewhere or by other contractors.

Evaluation Schedule

Performance will be monitored by the Research Management Unit (RMU) for a period of five years, in accordance with the Department's "Experimental Project Procedures." Annual Reports (FHWA 1461) are required as well as a Final Project Report (responsibility of the RMU).

1997:	Construction	Monitored by the RMU and reported by the Engineering Project manager.
1997:	Construction Report	Due in the Research Office 30 days after completion

of construction.

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| 1998: | June-August | Conduct visual examination of bridge deck, formal bridge inspection, perform crack counts, and rut measurements. Prepare and submit report no later than Sept. 15. Submit completed Form 1461 to FHWA prior to Sept 30. |
| 1999: | June-August | Conduct visual examination of bridge deck, perform crack counts, and rut measurements. Prepare and submit report no later than Sept 15. Submit completed Form 1461 to FHWA prior to Sept 30. |
| 2000: | Same as 1998 | |
| 2001: | Same as 1999 | |
| 2002: | June-August | Conduct visual examination of bridge deck and formal bridge inspection. Perform crack counts, prepare and submit report no later than Sept. 15. Complete final report and Form 1461 prior to Sept 30. |